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develop first as confervoid bodies, growing by a single apical cell. This body then becomes monostromatic, with a monosiphonous stipe. The two cells situated side by side at the same level below the apical cell initiate the monostromatic blade, and this blade becomes distromatic at base, and at the same time the monosiphonous stipe becomes polysiphonous. A new meristematic tissue appears at the transition region between blade and stipe. The growth both in length and breadth is due to the apical and stipo-frondal growth up to a certain period. The apical growth gradually diminishes and finally ceases, and then erosion of the apex of the blade follows. A single precortical layer of large parenchymatous cells is developed at the transition region between the already existing two layers. The hyphal cells are formed as the precortical layer becomes doubled, and the expansion of their distal ends into a trumpet shape takes place at the intercellular spaces. The ribs and meridional region are formed by special thickening of the cortical layers. The dorsiventrality of the lamina, if it exists, is indicated simultaneously with the formation of these parts. The cryptostomata in the Laminariaceae do not originate from a single cell.—S. YAMANOUCHI.

Geotropism.—ÁRPÁD PÁÁL¹⁴ finds that reduction of the air pressure lengthens the geotropic reaction and presentation times in the root of *Phaseolus vulgaris*. The presentation time was 6 minutes at one atmosphere; 20 minutes at 0.74; 35 minutes at 0.21; and 70 minutes at 0.08. The reaction time was found markedly variable when all controllable conditions were constant. From the average of many measurements, the author finds that if at one atmosphere the reaction time is considered as 1, at 0.74 atmosphere it is 1.09; at 0.34 atmosphere 1.39; at 0.21 atmosphere 1.60; and at 0.08 atmosphere 2.20. It is interesting to see what slight reductions in pressure cause a lengthening of these critical times. It is well known that the respiratory intensity is not cut until the pressure is reduced to a much greater degree. If the effects here are due to the reduced oxygen pressure, as is assumed, one sees what a complex rôle oxygen plays in the organism, the several functions apparently having very different critical pressures. The author concludes that the lengthening of the reaction time is due to the sum of the effect of reduced pressure upon the sensory and motor phases and to the telescoping of these phases.—WILLIAM CROCKER.

Formaldehyde and green plants.—GRAFE¹⁵ finds etiolated plants or non-chlorophyll parts of green plants very sensitive to vapors of formaldehyde, especially if the cultures are illuminated. The chlorophyll-bearing parts (*Phaseolus vulgaris*) are not injured by concentrations as great as 1.3 per cent

¹⁴ PÁÁL, ÁRPÁD, Analyse des geotropischen Reizvorgangs mittels Luftverdünnung. Jahrb. Wiss. Bot. 50:1-20. 1911.

¹⁵ GRAFE, VIKTOR, Untersuchungen über das Verhalten grüner Pflanzen zu Gasformigen Formaldehyde. Ber. Deutsch. Bot. Gesells. 29:19-26. 1911.